EXHIBIT D

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

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CASE NO.: CV 2:18-2402 SJO (FFMx) **DATE: July 18, 2019**

TITLE: Rhode & Schwarz GmbH & Co. KG v. Tektronix, Inc.

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PRESENT: THE HONORABLE S. JAMES OTERO, UNITED STATES DISTRICT JUDGE

Victor Paul Cruz	Not Present
Courtroom Clerk	Court Reporter
COUNSEL PRESENT FOR PLAINTIFFS:	**COUNSEL PRESENT FOR DEFENDANTS:**
Not Present	Not Present

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PROCEEDINGS (in chambers): CLAIM CONSTRUCTION ORDER

Plaintiff Rhode & Schwarz GmbH & Co. KG ("Rhode" or "Plaintiff") and Defendant Tektronix, Inc. ("Tektronix" or "Defendant") have filed claim construction briefs in which they ask the Court to construe five (5) disputed phrases found in the sole patent asserted in this litigation, U.S. Patent No. 7,860,674 ("the '674 Patent"). Plaintiff filed its Opening Claim Construction Brief ("Pl.'s Brief") on April 26, 2019. Defendant filed its Responsive Claim Construction Brief ("Def.'s Brief") on May 10, 2019. Plaintiffs filed a reply ("Pl.'s Reply") on May 17, 2019. The Court heard argument from counsel on June 12, 2019.

I. FACTUAL AND PROCEDURAL BACKGROUND

Plaintiff initiated the instant action on March 23, 2018, alleging that Defendant infringes the '674 Patent through the marketing, sale, offer for sale, and servicing of test and measurement products, including oscilloscopes and their components. (*See generally*, Complaint, ECF No. 1.) Defendant denies infringing the '674 Patent and asserts affirmative defenses of non-infringement, invalidity, prosecution history estoppel, and failure to mark under 35 U.S.C. § 287. (*See generally*, Answer, ECF No. 13.) On November 16, 2018, the Court held a scheduling conference in which it ordered that the Northern District of California's Patent Local Rules will govern the case and set a claim construction ("Markman") hearing for June 15, 2019. (Minutes of Sched. Conf., ECF No. 28.) The Court later rescheduled the Markman hearing for June 12, 2019. (Scheduling Notice, ECF No. 61.)

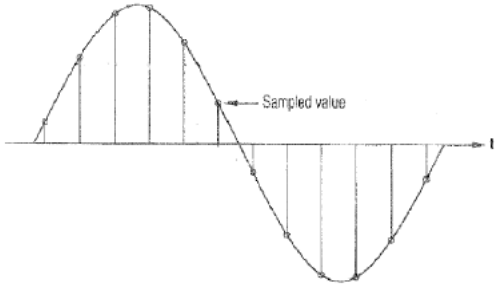
II. TECHNOLOGICAL SUMMARY

The '674 Patent issued on December 28, 2010 and claims priority to an earlier German patent application filed July 27, 2005. ('674 Patent Caption.) The claimed invention provides "a triggering method, a triggering system and corresponding digital oscilloscope . . . for a secure triggering, corresponding to the selected triggering condition, of the recording of one or more

measured signals on the display unit of the oscilloscope with a higher time resolution than the sampling rate of the analog-digital converter used in the digital oscilloscope." ('674 Patent col. 2:24-32.)

A. Oscilloscopes Generally

Oscilloscopes are devices capable of creating a visual representation of electronic signals. (Opening Decl. of John Villasenor, Ph.D. ("Villasenor Rep.") ¶ 37, ECF No. 55-3; Opening Decl. of Robert Witte ("Witte Rep.") ¶ 26, ECF No. 58-2.) They are used in a wide variety of technical fields and typically display one or more graphs wherein a horizontal axis is used to represent time and a vertical axis is used to represent the voltage of the signal being observed. (Villasenor Rep. ¶ 37.) While oscilloscopes originally utilized analog data, modern devices instead rely on data that has been digitized. (Villasenor Rep. ¶ 38.) Digitization involves sampling the analog signal at regular, discrete intervals. (Villasenor Rep. ¶ 38.) The more frequent the sampling, the higher the "resolution" of the digitized signal. An example of digitization can be seen in the image below, derived from Figure 3 of the '674 Patent. The image displays an analog signal (represented as a continuous sine wave) overlaid with digital sampling points (represented as hollow dots):



Because it is not always desirable to view a continuously-moving wave displayed in real time, oscilloscopes typically include a "trigger" functionality which can be used to display static portions of a signal. (Villasenor Rep. ¶ 39; Witte Rep. ¶ 28.) This is accomplished by having the user specify certain "triggering events" such as the amplitude of a signal passing a specified threshold. When the device detects that a triggering event has occurred, it captures the portion of the wave that follows. Oftentimes triggering is programmed to occur on each instance of a triggering event, resulting in an image that is refreshed each time the specified event occurs. When this is applied to a stable, repeating wave, it creates what is effectively a static image of the wave, allowing the user to observe its nature.

Traditionally, triggering has been performed using an analog trigger system. (Witte Rep. ¶ 31.) In these systems, an analog signal was split into two pathways, one being routed through an analog-digital converter and the other being fed through the triggering system. (Witte Rep. ¶¶ 31-33.) This split is displayed in Figure 1 of the '674 Patent:

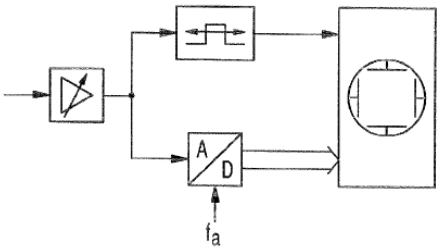


Fig. 1
(Prior art)

Analog signal data is fed into the triggering system and, when a triggering condition is detected (i.e., at the "triggering time"), a signal is generated to begin recording the digital stream from the moment the triggering condition was detected. (Witte Rep. ¶ 33.)

Digital triggering presents several advantages over the use of triggering using an analog system, however it presents problems of its own. (Witte Rep. ¶¶ 35-36.) Because the digitized signal is composed of discrete data points, it is possible—even likely—that the actual triggering time, i.e., the time at which the electronic wave crossed the threshold value, occurred between two sample points. This creates two potential problems. First, it creates a slight delay—known as a triggering offset—between the triggering event and the generation of a triggering signal. This delay results in a phase offset referred to as "jitter." Figure 3 of the '674 Patent shows a triggering point that lies between two sampled values:

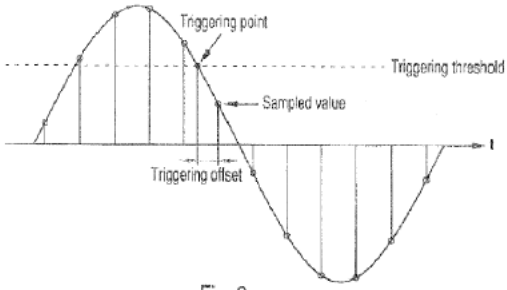
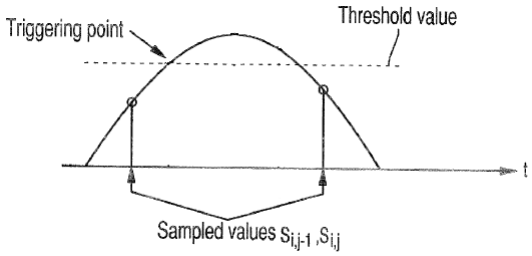


Fig. 3
(Prior art)

The larger the delay between the triggering point and the next sampled value, the larger the triggering offset and the resulting jitter. One way to combat this is the use of more frequent sampling. This is not always practical, however, as higher frequency sampling requires more computing resources and results in a more voluminous dataset.

Another problem faced by digital triggering systems is the creation of "blind spots" which occur when a triggering event falls between two sampling points, neither of which themselves satisfy a triggering condition. Unlike jitter, which merely creates an offset in the recorded data, blind spots cause the triggering system to miss triggering events altogether. An example of a blind spot can be seen in the image below, derived from Figure 12A of the '674 Patent:

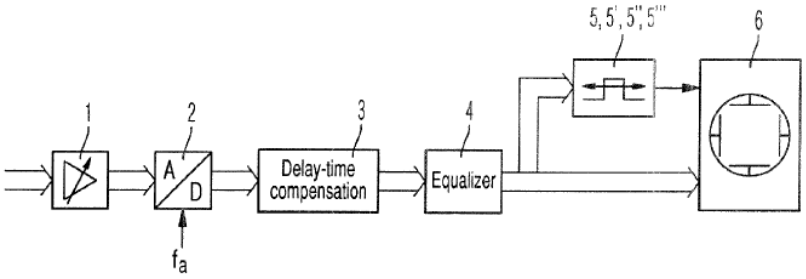


Because the triggering point occurred between two samples, the digital triggering system would not register any triggering event. Both jitter and blind spots were well-known problems in the field of digital oscilloscopes at the time of the invention of the '674 Patent.

B. The Claimed Invention

The '674 Patent discloses "a triggering method, a triggering system and a corresponding digital oscilloscope are provided for a secure triggering, corresponding to the selected triggering condition, of the recording of one or more measured signals on the display unit of the oscilloscope with a higher time resolution than the sampling rate of the analog-digital converter used in the digital oscilloscope." ('674 Patent 2:25-32.) The basic structure of the circuit can be seen in Figure 5:

Fig. 5



The circuit described in the '674 Patent immediately digitizes the analog signal and feeds the digital signal into both the triggering system and the recording unit. (Villasenor Rep. ¶ 50.) However, the unique technology claimed in the patent is not the use of a digital triggering system, which was already known in the art at the time of invention. (Witte Rep. ¶ 34.) Instead, the novel concept is the use of an interpolator to calculate data points that lie between sampling values. (Villasenor Rep. ¶ 53.) This allows for a significant reduction in triggering offset and results in less jitter and fewer blind spots. (Witte Rep. ¶ 67.)

The interpolator works by performing mathematical calculations to "fill in" data points between the sampled values. (Witte Rep. ¶¶ 77-78.) By providing interpolated data points between the directly measured values, the triggering system can determine more precisely the "triggering time"—that is, the time at which the triggering condition was met. (Witte Rep. ¶¶ 77-79.) The patent provides several examples of this. In Figure 11A, for instance, the signal crosses the threshold value at a point between two sample points:

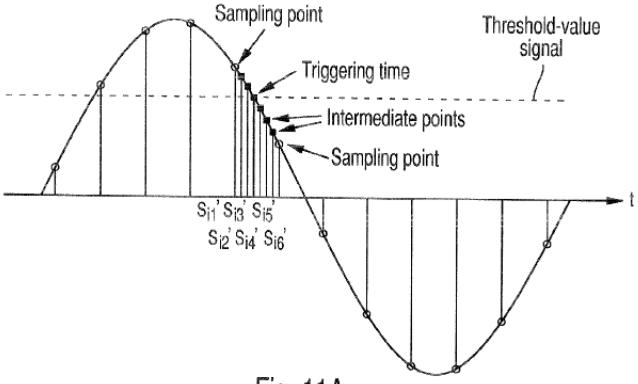


Fig. 11A

Without interpolation, there would be significant delay in triggering, resulting in jitter. With interpolation of intermediate data points, the delay and subsequent phase offset is greatly reduced or potentially eliminated.

Interpolation also increases the likelihood of detecting blind spots in the digital system. As shown in Figure 12A, a signal crosses the threshold value and peaks between two sampled values:

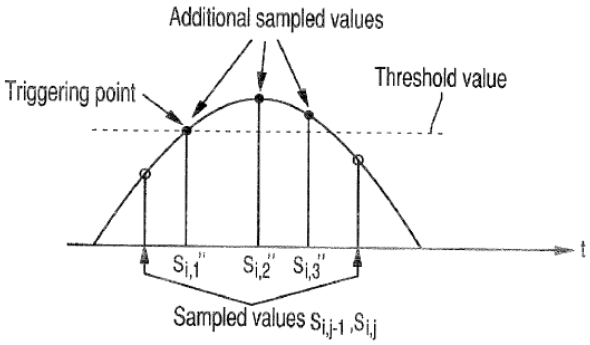


Fig. 12A

Absent interpolation, the triggering system would not detect any triggering condition. When intermediate values are calculated using interpolation, however, a triggering condition will be flagged by the system. Thus, the '674 Patent discloses a technique for more accurately detecting triggering times and detecting triggering conditions that would otherwise have been missed.

III. LEGAL STANDARDS

A. Principles of Claim Construction

Before a jury can determine if any of the asserted claims are invalid or if the defendant's technology infringes one or more asserted claims, the court must determine the meaning and scope of the asserted claims through the process of "claim construction." *Markman v. Westview*

Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 116 S. Ct. 1384 (1996). Only after the claims have been construed can the jury compare the allegedly infringing device against the claims. *Id.*

In *Phillips v. AWH Corp.*, 415 F.3d 1303, 1311-24 (Fed. Cir. 2005) (en banc), the en banc Federal Circuit set forth a number of principles to guide lower courts through the claim construction process. The general rule is that the words of a claim "are generally given their ordinary and customary meaning," which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* 1312-13 (citations omitted). "[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* at 1313.

"In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Id.* at 1314. "In such circumstances, general purpose dictionaries may be helpful." *Id.* Where, however, "determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art," courts look to other sources, including "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

Moreover, "[t]he claims themselves provide substantial guidance as to the meaning of particular claim terms," for example by observing "the context in which a term is used in the asserted claim." *Id.* Comparing the usage of a term across different claims and examining difference among claims can also provide valuable insight into the meaning of claim terms. *Id.*

"The claims, of course, do not stand alone," and the specification provides "the single best guide to the meaning of a disputed term." *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). One reason the specification is of paramount importance is that it "may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess." *Id.* at 1316; *see also Markman*, 52 F.3d at 980 ("[A] patentee is free to be his own lexicographer"). That said, "[t]hough understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim, limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Moreover, the prosecution history, which consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent, may also shed "decisive light" on the proper construction of a claim term, particularly where an applicant limits her invention to overcome prior art. *Regents of Univ. of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1372-73 (Fed. Cir. 2008); *Phillips*, 415 F.3d at

1316-17; *N. Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1345 (Fed. Cir. 2005); *Seachange Int'l, Inc. v. C-Cor Inc.*, 413 F.3d 1361, 1372-73 (Fed. Cir. 2005).

District courts may also rely on extrinsic evidence, which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises," in construing claims, although such evidence is afforded less significance than the intrinsic record. *Phillips*, 415 F.3d at 1317 (citations omitted). "[W]hile extrinsic evidence 'can shed useful light on the relevant art,' we have explained that it is 'less significant than the intrinsic record in determining "the legally operative meaning of claim language."'" *Id.* (citations omitted).

In summation, although "there is no magic formula or catechism for conducting claim construction . . . . certain types of evidence are more valuable than others," and "what matters is for the court to attach the appropriate weight" to each piece of evidence. *Phillips*, 415 F.3d at 1324.

B. Means-Plus-Function Claiming

In its opinion in *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015), the Federal Circuit modified the standard for determining whether a claim element is governed by 35 U.S.C. § 112, para. 6, which provides that

> [a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112(f). The Federal Circuit majority began by observing that although its "precedent has long recognized the importance of the presence or absence of the word 'means'" in determining whether § 112, para. 6 applies, and that a "strong" but rebuttable presumption had arisen that was tethered to the inclusion of the word "means." 792 F.3d at 1348-49. The majority found this "heightened burden [to be] unjustified," and accordingly "abandon[ed] characterizing as 'strong' the presumption that a limitation lacking the word 'means' is not subject to § 112, para. 6." *Id.* at 1349. The majority clarified that "[t]he standard is whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Id.* (citing *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996)). Thus, "[w]hen a claim term lacks the word 'means,' the presumption can be overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function.'" *Id.* (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

In applying these principles to the claims before it, the majority held that "[g]eneric terms such as 'mechanism,' 'element,' 'device,' and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word 'means'

because they 'typically do not connote sufficiently definite structure' and therefore may invoke § 112, para. 6." *Id.* at 1350 (quoting *Mass. Inst. of Tech. & Elecs. for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006)). The majority then concluded that the term "distributed learning control module" was subject to the provisions § 112, para. 6, notwithstanding the absence of the term "means." In particular, the majority noted that "[w]hile portions of the claim do describe certain inputs and outputs at a very high level (e.g., communications between the presenter and audience member computer systems), the claim does not describe how the 'distributed learning control module' interacts with other components in the distributed learning control server in a way that might inform the structural character of the limitation-in-question or otherwise impart structure to the 'distributed learning control module' as recited in the claim." *Id.* at 1351.

Where a claim element is subject to application § 112, para. 6, the court must then determine "whether the specification discloses sufficient structure that corresponds to the claimed function." *Id.* If the patentee fails to disclose adequate corresponding structure to perform all of the claimed functions, the claim is indefinite. *Id.* at 1351-52 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311-12 (Fed. Cir. 2012)).

IV. DISCUSSION

A. Term 1: "digital triggering"/"digital triggering system"

Term	Plaintiff's Construction	Defendant's Construction
"digital triggering" (claims 1 and 18)	triggering based on digital values	detecting occurrences of triggering conditions using digital values and generating triggering signals
"digital triggering system" (claim 22)	a system that triggers based on digital values	digital circuitry that detects occurrences of triggering conditions using digital values and generates triggering signals

The parties agree with one another that triggering must use digital values, however they disagree as to what "triggering" itself entails.[1] Plaintiff proposes what is essentially a plain meaning argument, contending that triggering is sufficiently well understood in the art that it needs no further explanation. (Mot. 3-8.) Defendant asks the Court to provide further construction, defining triggering as a two-step process requiring (1) the detection of triggering conditions and (2) the generation of triggering signals. (Opp'n 7-13.) While Defendant argues that these are not two independent steps, but rather two necessary parts of a single step, this appears to be a distinction without a difference.

[1] Defendant's dispute whether the triggering must be "based" on digital values, but neither disagrees that digital values must be used.

The Court starts, as it must, with the language found in the claims themselves. In the preamble, Claim 1 discloses "[a] method for digital triggering a recording of one or more signals on a digital oscilloscope." ('674 Patent col. 15:24-25.) None of the subsequent limitations explicitly require the generation of a triggering signal, and instead focus on the use of interpolation to determine a "triggering time." ('674 Patent col. 15:26-41.) The same is true of Claim 18, which describes "[a] system for digitally triggering [] a recording of one or more signals for a digital oscilloscope," and Claim 22, which is directed to "[a] digital oscilloscope." ('674 Patent cols. 17:16-34, 18:12-29.)

Despite the lack of an explicit reference to a trigger signal, however, each claim reveals that the purpose of the digital triggering system is to "digitally trigger[] a recording of one or more signals." ('674 Patent col. 17:16-17; *see also* '674 Patent cols. 15:24-25, 18:18-20.) As Mr. Witte explains, "a person of ordinary skill in the art would define a trigger system in terms of generating a triggering signal because that is the principal functionality for the circuitry, and what the systems downstream of the digital trigger expect from the digital trigger system." (Witte Rep. ¶ 91.) Plaintiff's own expert does not directly disagree with the technical premise that triggering is the primary purpose of a trigger system, instead making a legal argument: that Defendant's proposed limitation does not appear in the claims themselves, but is instead drawn from exemplary embodiments in the specification. (Villasenor Rep. ¶ 88.)

Dr. Villasenor is correct that trigger condition detection and trigger signal generation do appear in the specification and not in the claims themselves, however they appear consistently in each and every preferred embodiment. The specification discloses ten exemplary embodiments of the patent claims: four embodiments of the system claims and six embodiments of the method claims. In each, a trigger signal is generated upon detection of a triggering condition.

The "Detailed Description of the Preferred Embodiments" begins by describing three different units designed to generate a digital triggering signal. ('674 Patent cols. 5:12-8:33, Figs. 6A-6C.) As can be seen from the figures describing each system, their ultimate output is S_{TR}, or a triggering signal. ('674 Patent Figs. 6A-6C.):

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

CASE NO.: CV 2:18-2402 SJO (FFMx) **DATE: July 18, 2019**

Fig. 6A

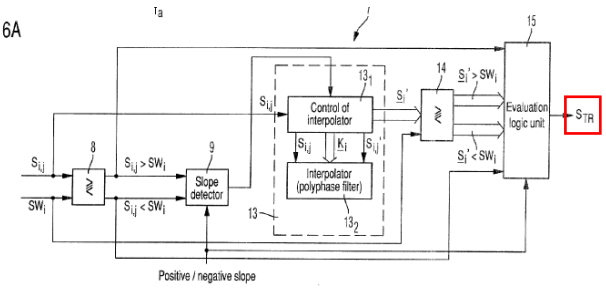


Fig. 6B

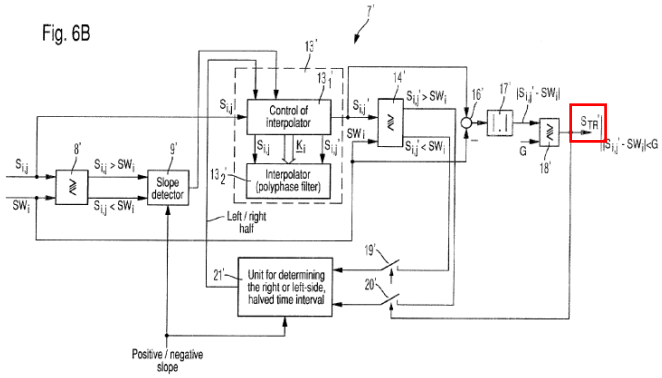
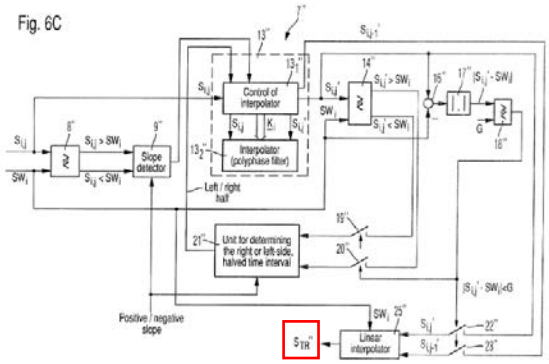


Fig. 6C

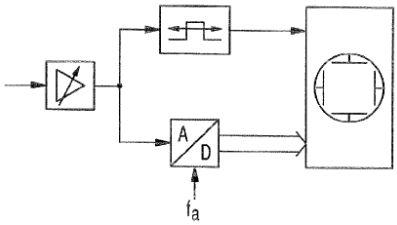


The specification states that one of these trigger signal generation units is to be incorporated into each of the four system claim embodiments: "[T]he following section presents the first, second and third embodiments of a unit for generating triggering signals, **which is incorporated alternatively in all of these embodiments of a system for digital triggering**, with reference to FIGS. 6A, 6B, and 6C." ('674 Patent col. 5:15-20) (emphasis added). The same is true of the specific embodiments of the method claims, which the '674 Patent describes repeatedly as a "method for digital generation of triggering signals." ('674 Patent col. 9:63-65 ("The first, second and third embodiment of the method for digital generation of triggering signals is presented below with reference to FIGS 8A, 8B, and 8C")[2]; col. 13:35-36 ("The fourth embodiment of the method for generating triggering signals shown in FIG. 10A . . ."); col. 14:6-9 ("The fifth embodiment of the method for generating triggering signals shown in FIG 10B . . ."); col. 14:63-64 ("FIG. 10C presents a sixth embodiment of the method for generating triggering signals")). Thus, the specification describes each of the preferred embodiments—both systems and methods—as comprising a means for generating a digital triggering system.

That digital triggering requires generation of a triggering signal is further supported by an understanding of the purpose and function of oscilloscopes. Plaintiff's expert acknowledges that the purpose of the triggering system in an oscilloscope is to permit the capture of a specific

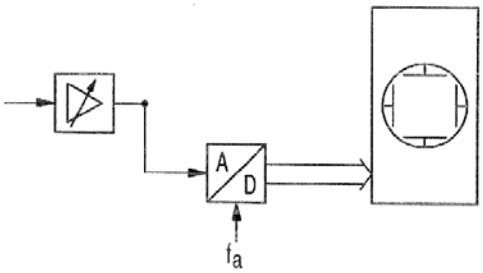
[2] While Plaintiff notes that the flowcharts provided in 8A-8C do not mention a triggering signal, the specification explicitly lists the corresponding embodiments as "method[s] for digital generation of triggering signals."

portion of an electronic signal. (Villasenor Rep. ¶ 38.) This is accomplished in the patent through the use a parallel circuit whereby the signal is simultaneously passed through two paths.



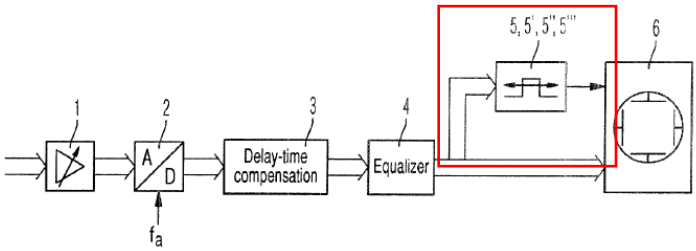
('674 Patent, Fig. 1, depicting a prior art analog triggering system.) One of those paths contains the digital triggering system and the other an unaltered digital signal. When the digital triggering system detects a triggering event, it calculates a triggering time and a triggering signal is generated. ('674 Patent 1:42-47.) This triggering signal causes the oscilloscope to capture the parallel unaltered waveform beginning at that triggering time. Thus, in order for the oscilloscope to fully function as described in the patent, a triggering condition must be detected and a triggering signal must be generated. For these reasons, the Court concludes that "digital triggering" as used in the '674 Patent requires the generation of a triggering signal.

The same is true of the term "digital triggering system." In essence, the parties' arguments regarding this term are an exercise in line drawing. Plaintiff ultimately does not dispute that the generation of a triggering signal is an important function of an oscilloscope, but instead argues that it "[is] distinct from determining a triggering time." (Pl.'s Brief 5.) Thus, Plaintiff's argument is that the component responsible for signal generation lies downstream—and outside—of the digital trigger system itself. The Court disagrees with this view. It seems clear that an oscilloscope can exist that does not have triggering capability; that is, where the wave is recorded or displayed in real time as the signal is received. In such a system, there would presumably be no parallel circuit and the waveform would be sent directly to a recording device. The following image, derived from Figure 1 of the '674, demonstrates how such a circuit would operate:



It is only when triggering capability is introduced that a parallel circuit is required. It is intuitive, then, to include the entirety of that parallel circuit in the definition of a "digital triggering system." In the '674 Patent, the parallel circuit includes components designed to detect a triggering condition as well as those designed to generate a triggering signal when a condition is detected:

Fig. 5



Thus, it is proper to understand the "digital triggering system" as being capable of both detecting a triggering condition and of generating a triggering signal in response.

This does not, however, mean that a triggering system must generate a signal every time a triggering condition is found. Nowhere in the patent claims or specification is there any express requirement that a signal be generated every time a triggering event is detected. Thus, in order for such a limitation to apply, it must derive from a POSITA's understanding. Yet, as Plaintiff notes, there are numerous scenarios—including in Defendant's own patents—in which a trigger signal is undesirable and may be blocked. (Pl.'s Brief 6) (citing U.S. Patent No. 4,585,975). Accordingly, the Court concludes that, while a digital triggering system must be **capable** of generating a digital signal upon detecting a triggering condition, it need not do so every time that it encounters such a condition.

Finally, Plaintiff asks the Court to determine whether the construction should be phrased in the singular or the plural. That is, whether digital triggering requires the detection of multiple triggering conditions and the generation of multiple triggering signals, or whether a single triggering condition and a single triggering signal are sufficient. Defendant does not address this issue in its brief and the Court finds nothing in the '674 Patent supporting the position that "digital triggering" requires multiple instances of detection or generation of a triggering signal. For these reasons, the Court defines the claim terms as follows:

Term	Court's Construction
"digital triggering" (claims 1 and 18)	detecting the occurrence of a triggering condition using digital values and generating a triggering signal
"digital triggering system" (claim 22)	digital circuitry that detects the occurrence of a triggering condition using digital values and is capable of generating a triggering signal

B. Term 3: "digital triggering system configured to determine a triggering time"

Term	Plaintiff's Construction	Defendant's Construction
"digital triggering system configured to determine a triggering time" (claim 22)	Plain and ordinary meaning In the alternative: digital triggering system [which is separately construed]	[digital triggering system] configured to determine when to generate a triggering signal

	configured to determine one or more triggering times	

The next term identified for construction is closely related to the first. Defendant seeks construction of the phrase "digital triggering system configured to determine a triggering time," again asking the Court to require that the digital triggering system generate a triggering signal. As discussed above, however, the '674 Patent does not require that the system actually generate a signal—only that it be configured to do so. Furthermore, the Court finds no justification for replacing "determine a triggering time"—the express term used in the claim—with "generate a triggering signal." For these reason, the Court rejects Defendant's proposed construction.

Plaintiff contends that the phrase does not require any construction, arguing that it is sufficiently clear as written. It does, however, ask the Court to specify that determination of a single triggering time is sufficient and that the claim does not require multiple triggering conditions and triggering signals. It notes that the phrase uses the singular article "a," and that the Federal Circuit "has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'" *IKJC Corp. v. Kinetic Concepts, Inc.,* 223 F.3d, 1351, 1356 (Fed. Cir. 2000). In the absence of any evidence that the patentee intended otherwise, the Court adopts the ordinary understanding of the indefinite article and holds that the term should not be limited such that the triggering system must determine multiple triggering times and therefore includes the phrase "one or more."

Furthermore, the Court finds it appropriate to provide the jury with guidance regarding the meaning of the term "triggering time," which, while not identified for independent construction, appears in the present claim term and is not a term found in common parlance. In the specification, the '674 Patent states that that, in the invention, "a more precise triggering time is calculated as the intersection between the threshold value SW_i and the reference signal S_i . . ." ('674 Patent col. 15:3-5.) It seems, therefore, that the patent uses the term "triggering time" to describe the time at which a triggering condition occurs. This understanding is further supported by numerous of the patent's figures, such as Figs. 11A and 11B:

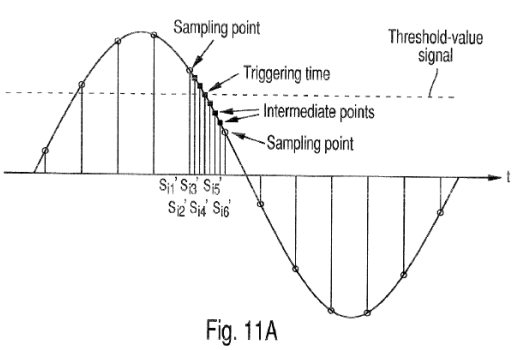


Fig. 11A

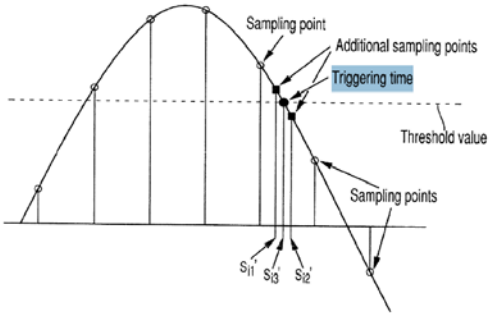


Fig. 11B

From this, the Court concludes that the phrase "digital triggering system configured to determine a triggering time" should be construed as "digital triggering system configured to determine the time at which the threshold value and reference signal intersect."

Term	Court's Construction
"digital triggering system configured to determine a triggering time" (claim 22)	digital triggering system configured to determine the time at which the threshold value and reference signal intersect

C. Term 4: "wherein the digital triggering system determines each triggering time occurring, which provides a higher time resolution than the sampling rate of the analog-digital converter"

Term	Plaintiff's Construction	Defendant's Construction
"wherein the digital triggering system determines each triggering time occurring, which provides a higher time resolution than the sampling rate of the analog-digital converter" (claim 22)	Plain and ordinary meaning In the alternative: wherein the digital triggering system [which is separately construed] determines each of the one or more triggering times occurring, which provides a more precise triggering time than a triggering time based only on samples generated according to the sampling rate of the analog-digital converter	Wherein the digital triggering system detects every occurrence of a triggering condition regardless of the selected threshold value, by detecting triggering conditions at a higher time resolution than the sampling rate of the analog-digital converter and generating triggering signals in response thereto

Defendant next seeks construction of the "wherein" clause of claim 22, arguing that it requires that a triggering signal must be generated at every occurrence of a triggering condition. (Def.'s Brief 13-14.) In so arguing, Defendant focuses on the use of the phrase "*each* triggering time occurring."

In traditional digital triggering systems that do not use interpolation, it is possible to have "blind spots" where the system misses a triggering condition that takes place between two sampling points. This is an inherent flaw in digital sampling, particularly when measuring a high frequency signal with a low sampling resolution. Examples of this problem can be seen in the Figures 12A and 12B in the '674 Patent:

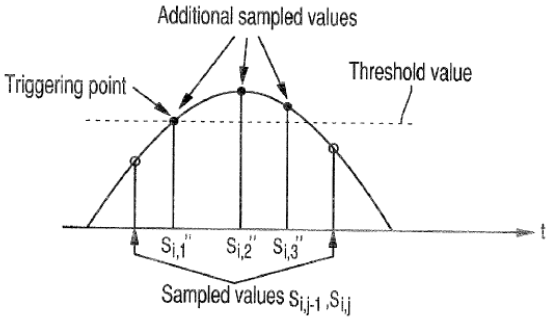


Fig. 12A

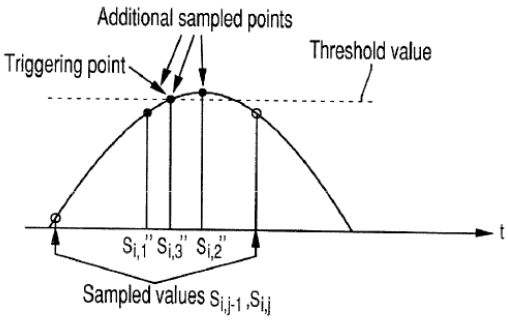


Fig. 12B

In these figures, the sampled values, $S_{i,j-1}$ and $S_{i,j}$ are shown as hollow dots. Because the sampled values both fall below the threshold value, a traditional digital triggering system would not know that a triggering condition had occurred and would therefore not generate a trigger signal. The system in the patent, however, is able to calculate values between the two sampling points, thereby filling in the missing data. These interpolated values, $S_{i,1"}$, $S_{i,2"}$, and $S_{i,3"}$, are shown as filled dots in the figures above. Using these interpolated data points, the triggering system would be able to detect that a triggering condition had been met, calculate a triggering point, and generate a triggering signal. The '674 Patent clearly contemplates the blind spot problem and is intended, at least in part, to address this issue and generate more accurate results.

Defendant contends that it is this ability to trigger on each occurrence of a triggering condition that makes the patented method "secure." (Def.'s Brief 14.) It asks the Court to conclude from this, along with the "each" language used in the claim, that the patent requires an oscilloscope to trigger—as defined by the Court in its previous construction—each and every time a triggering condition occurs. Because the Court previously concluded that "digital triggering" requires that a signal be generated, Defendant is essentially asking the Court to require that the system generate a signal for every triggering condition. Plaintiff counters that an oscilloscope need not send a signal every time it a triggering condition occurs, and again notes that it is sometimes desirable to prevent the generation of a signal. As the Court concluded previously in relation to term 1, while the triggering system must be capable of generating a triggering signal, it need not do so on every occurrence of a triggering condition. For this reason, the Court rejects the inclusion of this limitation in Defendant's proposed construction.

Nevertheless, the plain language of the claim itself mandates that "the digital triggering system determine[] each triggering time occurring" and it is improper to read the word "each" out of the claim entirely. ('674 Patent col. 18:22-23.) Notably, the claim's language specifies that the device must detect each *occurrence* of a triggering condition, not merely every *measurable* occurrence. As Plaintiff has failed to identify any clear and unambiguous redefinition of this plain

language, the Court concludes that the digital triggering system must detect each and every occurrence of a triggering condition and that it must not be subject to blind spots.

Term	Court's Construction
"wherein the digital triggering system determines each triggering time occurring, which provides a higher time resolution than the sampling rate of the analog-digital converter" (claim 22)	Wherein the digital triggering system detects each occurrence of a triggering condition by detecting triggering conditions at a higher time resolution than the sampling rate of the analog-digital converter

D. Term 2: "overshooting"/"undershooting"

Term	Plaintiff's Construction	Defendant's Construction
"undershooting" (claims 2 and 4)	A first sampled value is greater than a threshold value and a second sampled value is less than the threshold value	Plain and ordinary meaning
"overshooting" (claims 2 and 3)	A first sampled value is less than a threshold value and a second sampled value is greater than the threshold value	Plain and ordinary meaning

Plaintiff identifies the terms "undershooting" and "overshooting" for construction. It contends that the term applies only to digital values because it requires that the threshold value fall between two **sampled** values. Defendant disagrees and argues that the '674 Patent also uses the terms in reference to analog waveforms that rise above or fall below the threshold value. For this reason, Defendant asks the Court to determine that the plain and ordinary meaning of the term applies.

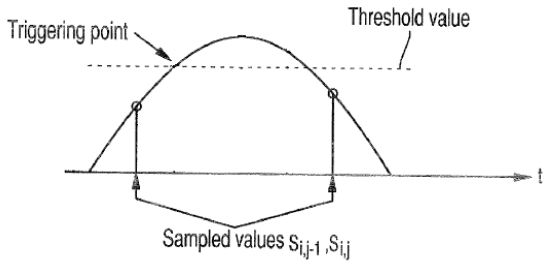
Claim terms are presumed to have their plain and ordinary meaning to a POSITA at the time of the invention unless that meaning is inconsistent with the use of the term in the specification. This presumption may be rebutted only when the patent clearly and unambiguously set forth a different definition of the term. Here, Defendant contends that the common understanding of the term "overshooting" is "to go over/to go past" and the common understanding of the term "undershooting" is "to go under/to fall short." (Def.'s Brief 20.) Plaintiff does not dispute this, but instead argues that the patent specifically redefines the term when it states that:

> If an overshooting of the threshold value by the digitized reference signal occurs within two sampled values—first sampled value<threshold value, second sampled value>threshold value, or if an undershooting of the threshold-value signal by the digitized reference signal occurs within two sampled values—first sampled value>threshold value, second sampled value<threshold value, the exact triggering time is determined by calculating several additional sampled values of the reference signal . . .

('674 Patent col 2:38-46.) While Plaintiff is correct that this is an explicit definition, it is not a definition of the term "overshooting," but rather of the term "overshooting of the threshold value by the digitized reference signal." The term "overshooting" is instead used consistent with its commonly understood meaning.

Moreover, Defendant points to several places in the specification where it believes the term is defined more broadly than Plaintiff argues. The first relates to prior art systems where "an analog triggering system . . . compares the measured signal present at the respective input A, and pre-amplified with reference to its amplitude, in each case with reference to overshooting or undershooting the level of a threshold-value signal present at the input B, in order to form complex triggering conditions." ('674 Patent col. 1:33-40.) While perhaps worded inartfully, it seems that the patent does indeed describe analog signals crossing the threshold value as either undershooting or overshooting the mark.

The second appears later in the patent in connection with the invention's solution to "blind spots." Plaintiff's proposed definition requires that one sampled value be above the threshold and one sampled value be below the threshold. With a blind spot, however, the signal crosses the threshold without either of the sampled values doing so:



(Derived from '674 Patent, Fig. 12A.) Thus, applying Plaintiff's proposed definition, "overshooting" and "undershooting" would not apply to blind spots. The specification of the '674 Patent, however, uses both terms in the context of blind spots:

> [I]t may, under some circumstances, occur, that, as a result of an excessively-low sampling rate, the reference signal Si between the two successive sampled values, $S_{i,j}$, $S_{i,j-1}$ of the reference signal Si overshoots the threshold value SW_i without bringing about a triggering. Accordingly, it can also occur that, in the case of an

> overshooting of the threshold value SW_i by the two successive sampled valued $S_{i,j}$, $S_{i,j-1}$ of the reference signal S_i, the reference signal S_i between the two successive sampled values $S_{i,j}$, $S_{i,j-1}$ undershoots the threshold SW_i as a result of an excessively-low sampling rate without bringing about a triggering.

('674 Patent col 13:10-24.) In light of this, it is clear that Plaintiff's proposed limitation is inconsistent with the specification. Nevertheless, the Court finds that it must "ensure that questions of the scope of the patent claims are not left to the jury. In order to fulfill this obligation the court must see to it that disputes concerning the scope of the patent claims are fully resolved." *Every Penny Counts, Inc. v. Am. Express. Co.*, 563 F.3d 1378, 1383 (Fed. Cir. 2009). In order to fully resolve the dispute, the Court finds it necessary to construe the claim term and not merely give it its plain and ordinary meaning. For this reason, the Court construes the term "undershooting" as "when a reference signal crosses below the threshold value" and overshooting as "when a reference signal crosses above the threshold value."

Term	Defendant's Construction
"undershooting" (claims 2 and 4)	When a reference signal crosses below the threshold value
"overshooting" (claims 2 and 3)	When a reference signal crosses above the threshold value

E. Term 5: "a recording unit for the presentation of the at least one signal to be presented"

Term	Plaintiff's Construction	Defendant's Construction
"a recording unit for the presentation of the at least one signal to be presented" (claim 22)	Plain and ordinary meaning	Term "recording unit" is governed by 35 U.S.C. § 112(6)

With the final term, Defendant asks the Court to find that the term "recording unit" is a nonce word governed by 35 U.S.C. § 112(6) and that the specification fails to sufficiently disclose its structure. Plaintiff argues that the term is not a nonce word and that even if it were governed by § 112(6), it is a known term and is ultimately unnecessary for the jury's understanding of the infringement determination. (Pl.'s Brief 13-15.)

Rhode & Schwarz first cites to a "rebuttable presumption" that § 112(6) does not apply to a claim term that does not use "means." (Pl.'s Brief, 17.) However, this is not a strong presumption and can be overcome "if the challenger demonstrates that the claim term fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function." *Williamson*, 792 F.3d at 1349. Applying this standard, the Court concludes that the term "recording unit" is a nonce term and is therefore governed by 35 U.S.C. § 112(6). As the

Federal Circuit determined in *Williamson v. Citrix Online, LLC*, "generic terms such as 'mechanism,' 'element,' 'device,' and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word 'means.'" 792 F.3d at 1350. The term "unit" is just such a verbal construct as it provides the reader with no specific structure on its own and instead relies on the use of functional gerund, "recording." *Diebold Nixdorf, Inc. v. International Trade* Commission, 899 F.3d 1291, 1301 (Fed. Cir. 2018)("the word 'unit,' which the [] patent uses to describe thirteen distinct components of the invention, does not, standing alone, connote any particular structure. Nor is sufficient structure imparted by modifying the word 'unit' . . ."). The term itself provides no indication of the unit's structure, only its function—to record.

Plaintiff contends that this is a term used in the field and that a POSITA would understand it to refer to a specific structure. Yet Plaintiff never describes that structure, instead relying itself on functional descriptions, stating merely that "the '674 patent discloses that the 'recording unit' is being used 'in the presentation of the measured signal' and that 'sampled values of the digitized, equalized measured signal' 'are presented on a screen of the recording unit 6 of the digital oscilloscope" and that "a POSITA would understand that the 'recording unit' of an oscilloscope visualizes a signal's waveform whose sampled values have been stored by the oscilloscope." (Pl.'s Brief 14.)

In support of its position, Plaintiff directs the Court's attention to several prior art patents that discuss "recorders," "recording units" or "recording system." However, these systems are easily distinguishable from the "recording unit" at hand here as each supports the generic term with a more specific description of the device itself. U.S. Patent No. RE34,843, for instance, discloses a "signal controlled waveform recorder" and the specification provides detailed information—including circuit diagrams—about the structure and operation of the device. (Pl.'s Brief, Exh. L.) The same is true of U.S. Patent No. 6,850,237 which is directed to a "waveform recording system." (Pl.'s Brief, Exh. N.) In each of these instances the patents are not simply relying on knowledge of a POSITA and are instead disclosing—and claiming—a unique device. Far from supporting Plaintiff's position, these references show the level of detail required to properly inform a POSITA what is meant by "recording unit" and serve to underscore the '674 Patent's deficiencies.

Because the Court finds that "recording unit" is a nonce word governed by 35 U.S.C. § 112(6) and because Plaintiff has not identified any corresponding structure in the specification, it must conclude that the term is indefinite.

Term	Court's Construction
"a recording unit for the presentation of the at least one signal to be presented" (claim 22)	Term "recording unit" is governed by 35 U.S.C. § 112(6).

V. RULING

For the foregoing reasons, the Court construes the disputed claim terms as follows:

Term	Construction
"digital triggering"	detecting the occurrence of a triggering condition using digital values and generating a triggering signal
"digital triggering system"	digital circuitry that detects the occurrence of a triggering condition using digital values and is capable of generating a triggering signal
"overshooting"	when a reference signal crosses above the threshold value
"undershooting"	when a reference signal crosses below the threshold value
"digital triggering system configured to determine a triggering time"	digital triggering system configured to determine the time at which the threshold value and reference signal intersect
"wherein the digital triggering system determines each triggering time occurring, which provides a higher time resolution than the sampling rate of the analog-digital converter"	wherein the digital triggering system detects each occurrence of a triggering condition regardless of the selected threshold value, by detecting triggering conditions at a higher time resolution than the sampling rate of the analog-digital converter
"a recording unit for the presentation of the at least one signal to be presented"	Term "recording unit" is governed by 35 U.S.C. § 112(6).

IT IS SO ORDERED.